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This article examines performance funding, specifically one common performance measure—student persistence—to explore if the outcomes are those intended. The article analyzes the effects of performance-based funding measures at three institutions within a single state: a flagship university, a Historically Black University, and a regional, comprehensive institution. Critical suggestions are made on how performance funding formulas can be developed.

Funding mechanisms for higher education are complex even in their simplest form. Added to this calculus is the recent move to address accountability through performance indicators. Funding formulas that once relied on input measures such as student credit hours, full-time students enrolled, or number of faculty are being supplemented or replaced by output measures such as retention and graduation rates. Acknowledging the old maxim, "What gets measured gets done," this study examines the results of student persistence, a common performance measure, to explore if the outcomes are those intended. The study addresses the following questions using a state that has a performance funding system:

1. How do the factors of background, achievement, and college experiences influence first-to-second year persistence, a persistence indicator in this state? Which factors influence minority persistence?
2. How do institutional characteristics influence students' persistence from the first to second year of higher education?
3. What are the policy implications of using persistence as a performance indicator?

Historical Background

State Formulas Change to Meet Various Objectives

Since Texas started using a formula to fund higher education in the 1950s, state formulas have evolved to satisfy different objectives. In the 1950s, the objective of formulas was adequacy. In the 1960s, 1970s, 1980s, and 1990s, formulas changed to meet the objectives of growth, equity, stability, and accountability, respectively (Carruthers, Marks, & Walker, 1994). Currently, thirty states use formulas in some aspect of their higher education budgeting and resource allocation process (McKeown, 1996). Formula development has been uneven over the last 40 years, with many state policymakers copying formulas found successful by other states and adapting them to their own state's specific circumstances (McKeown & Layzell, 1994).

In the 1980s, legislative bodies and the public at large began to focus on the quality of undergraduate education; the resulting movement to improve assessment and accountability has been the predominant issue of the current decade. Concomitant with this emphasis on accountability was the demand for institutions to demonstrate their productivity in the form of a predetermined set of performance indicators. The tempo of the formation of performance indicators was influenced by two major factors: legislative mandates and efforts by coordinating and governing boards to avoid additional legislative mandates (Ewell, 1994). Ewell notes, "As a result, few [performance indicators] have been guided by prior analysis of statistics that would identify those most appropriate for systematic decision making and public reporting" (p. 150). The pace of development and the tendency of states to copy other states' indicators have created a common core of indicators (Gaither, et al., 1994).

Even if performance funding is the "programme du jour" and will go the way of zero-base and programming budgeting, will this short-lived experiment cause irreparable harm to higher education and to individual institutions?

After aborted attempts to link performance and funding in Texas and Wisconsin (Bateman & Elliott, 1994; Epper, 1994), Arkansas, Kentucky, and Florida joined Tennessee in directly linking funding to institutional performance on a set of predetermined indicators. While all of these states only use performance funding on the margin—between one and five percent—South Carolina recently passed legislation mandating the development of performance standards and directing ". . . the Commission to base the higher education funding formula on an institution's achievement of these standards" (*Code of Laws of South Carolina*, ¶59-103-15, as amended).

Effects of Performance Funding

The trend toward linking funding directly to performance and the lack of sophistication in the development of indicators generates the same intensity of questions as the assessment debate did in the 1980s. Even if performance funding is the *programme du jour* and will go the way of zero-base and programming budgeting, will this short-lived experiment cause irreparable harm to higher education and to individual institutions? Alternately, if the trend becomes permanent, will the current hastily developed indicators bring about the appropriate fundamental changes on campuses and in the states?

Performance Indicators

One of the most commonly used performance indicators is "enrollment, progression, retention, and graduation by ethnicity." Persistence from one year to the next is used as an indicator in each of the ten states in the 1994 Education Commission of the States Case Study (Ewell, 1994; Richardson, 1994). The inclusion of this measure not only clearly reflects the ongoing statewide concern over the enrollment, retention, and graduation of all students, especially minorities, but it is also an excellent example of an easily accessible measure of a complex

behavior (i.e., persistence). Most states have been collecting these data as a part of their federal, state, and NCAA reporting requirements. Further, this traditional measure of institutional effectiveness can be included without controversy over measurement technique.

However, the performance funding indicators have not been purposefully linked to persistence research, which has shown that persistence at a specific institution is as much a factor of background and financial aid as institutional characteristics (Pascarella & Terenzini, 1980; Pascarella & Chapman, 1983; St. John, 1990; Somers, 1994, 1995, 1996).

As noted previously, the majority of the performance indicators were developed quickly and without a strong conceptual framework. While retention and graduation are the ultimate goals of colleges and universities, does the linking of funding to these results change the dynamics of this objective? Is this measure a result of changes to educational programs, selective enrollment patterns, state funding, financial aid, changing demographics, or random chance?

Method

Study Site

The state in which the study is located shifted from a student credit-hour driven formula to a performance-based formula for funding higher education for the 1995-97 biennium. Seventeen benchmark measures were used to allocate "productivity" funds over and above the funding base. The principal goal was "to increase the retention of first-time, full-time degree-seeking students at all levels of postsecondary education." The measures associated with this goal dealt with retention of students in three categories: all students, minority students, and developmental students.

Case Study Institutions

In the fall of 1996, data on all students were collected from the three four-year universities in a Midwestern multi-campus university system. The first institution is a research-intensive university, the second is a residential Historically Black University (HBCU), and the third is a master's degree institution. Each of the institutions submitted student information that is reported annually to the state.

Sample

Student data were collected for the three institutions for the fall semesters of 1993, 1994, 1995, and 1996. The data contained demographic, academic, and placement data on all students registered at each of the institutions. All full-time, first-year students were identified and matched against continuing students in the subsequent year at each of the case study institutions. First-year students appearing as continuing students at the same institution in the subsequent year

were identified as persisters and those who did not appear were identified as non-persisters. This definition was used to correspond to the definition of the performance funding measure under study.

Table 1 summarizes the sample size for each cohort by institution. After initial observation and analysis, it was determined that for the pseudo r^2's for the HBCU were somewhat smaller than the like statistic for the other campuses. This indicated a smaller degree of fit of the original model for the HBCU than for the other two campuses. The authors reevaluated the research on minority persistence and attainment (Sewell, 1968; Sewell, et al., 1970; Sewell, 1971; Sewell, 1972) and decided to request additional data from the HBCU. Those data were analyzed separately from the original submission using similar techniques as the previous data. The expanded model data elements are listed in Table 4.

TABLE 1
Total Cohort Population by Year and Institution*

	Research-intensive Institution		HBCU Institution		Master's Institution	
Persisters 1993 to 1994	1504	72.34%	514	54.16%	284	54.2%
Non-persisters from 1993 to 1994	575	27.66%	435	45.84%	240	45.8%
Persisters 1994 to 1995	1631	72.59%	399	50.38%	256	51.6%
Non-persisters from 1994 to 1995	616	27.41%	393	49.62%	240	48.4%
Persisters 1995 to 1996	1487	64.21%	330	56.70%	265	52.7%
Non-persisters from 1995 to 1996	829	35.79%	252	43.30%	238	47.3%

* *Includes both full-time and part-time students.*

Model Specifications

In the model used for this study, we focused exclusively on the progression of full-time students from the first year to the second year of college at a single multi-campus system because this was a key indicator in this state. We attempted to determine not only a prediction model for persistence, but also the dynamics of the introduction of an external impetus: rewarding persistence through increased funding to the institution. We looked at the basic demographic and institutional variables, and how institutional decisions, such as placement in remedial classes, affected persistence.

The research on persistence suggests that the ideal model to predict persistence would include background, financial aid, and campus experience variables collected through existing records and questionnaires/interviews. Without access to a large sample of students on each campus to interview, however, we were limited in the data that we could obtain

from the institutions. This limitation reflects the problem of only using easy-to-gather data for performance indicators.

Limitations

There were several other limitations in the study. Only three years of data were examined: the two years prior to performance funding and the year in which the performance funding program began. This may be too short a period of time to obtain a clear picture of the impact. A longer study might show clearer trends, and could also determine whether the indicators are durable.

The model was also limited in the number of variables. We would like to have been able to include net cost, financial aid, and additional college experience variables. Where we had used Federal Pell Grant as a proxy for income, the model better predicted who would not persist. However, we were strategically limited because of the state student information system, which contained a limited number of variables. Moreover, socioeconomic background has not been considered in the policy calculus for performance funding.

While gender and age under 19 were negatively associated with persistence for the 1995 entering class, having a declared major was positively associated with re-enrolling the following fall.

The study was also limited to a single state university system. While the performance funding scheme adopted by the legislature was fairly typical, the institutions and students may have been atypical. A multi-state study would provide more comparative information.

Finally, the study was limited to full-time students because the performance indicators in this state only consider full-time students. Ironically, it is part-time students, many of whom are older and more experienced, who may be the loudest voices in demanding public accountability for higher education. By limiting the indicators to full-time students, the ability to become more accountable to part-time students was ignored.

Statistical Method

To describe the relationship between an outcome (dependent) variable and one or more explanatory (independent) variables the study uses statistical regression methods. Regression techniques are used to find the "best fit" between the explanatory variables and the outcome variable. For a model where the outcome variable is dichotomous, logistic regression is used. Since a student chooses to persist or not, the outcomes are dichotomous: either yes or no (coded as 1 or 0). The resulting graph of the relationship is not a straight line, but a curved line bounded by 0 and 1.

Because of the ease in interpretation, we converted beta coefficients to delta-p statistics using a method recommended by Peterson (1984). The delta-p measures change in the dependent variable. For dichotomous variables, the delta-p provides a measure of the extent to which the outcome was likely

to change if a student had the specified characteristic. For example, a delta-p of 0.050 for females is interpreted as increasing the probability of enrollment by 5.0 percentage points for this group.

Results

This section presents the results from the logistic analysis. First, the findings from each institution by year are presented, then the overall results are described.

Research-intensive Institution

For the first-year, full-time class entering in 1993 and persisting to fall 1994 (see Table 2), six variables were significantly associated with persistence. Students who had ACT scores in the lower third of the class were 6.40 percentage points less likely to persist. Women were 12.21 percentage points less likely to persist than men. Older students were 14.74 percentage points less likely to re-enroll the following fall and those under the age of 19 were 11.46 percentage points less likely to persist than students whose ages ranged from 20 to 28. In-state residents were 5.66 percentage points more likely to persist. Placement in remedial classes had a significant negative association with persistence. Students in math remediation were 12.57 percentage points less likely to persist. Students who took a heavy load, 15 hours or greater, were 4.78 percentage points more likely to persist than those taking a lighter course load.

For the class entering in the fall of 1994, four variables were significant and associated with persistence to the fall of 1995. Women were 6.00 percentage points more likely to persist. In-state residents were 10.65 percentage points less likely to persist, and again the ethnicity variables were not significant, but the delta-p values were positive. Students under age 19 were 12.03 percentage points more likely to persist than students from age 20 to 28. Students placed in remedial math classes were 16.01 percentage points less likely to persist.

For the full-time entering class of 1995, seven variables were significantly associated with persistence to the fall of 1996. Students who scored on the upper third of the ACT in this class were 21.13 percentage points less likely to persist than students with "mid-range" scores. Students who received a high school diploma (versus a GED or alternative assessment) were 42.30 percentage points less likely to persist. Women were 13.3 percentage points less likely to persist than men. Older students were 14.74 percentage points less likely to re-enroll the following fall and those under the age of 19 were 11.46 percentage points less likely to persist than students whose ages ranged from 20 to 28. Placement into one of two remedial classes was positively associated with persistence: mathematics (21.09 percentage points) and reading (3.59 percentage

TABLE 2
Results from the Research-intensive Institution

	1995		1994		1993	
Variable	**Beta**	**Delta-p**	**Beta**	**Delta-p**	**Beta**	**Delta-p**
In-state resident	0.3481	0.0764	-0.4997	-0.1065 *	0.3162	0.0566 **
Gender (female)	-0.5441	-0.1326 **	0.3366	0.0592 **	-0.5623	-0.1221 **
Asian	-4.9270	-0.4928	1.7405	0.2012	6.8814	0.4990
African American	-4.6429	-0.6181	0.3771	0.0656	6.4492	0.2626
Hispanic	-4.1257	-0.6181	-0.2874	0.0656	4.8983	0.2626
Native American	-3.8233	-0.5980	0.1788	0.0328	6.0190	0.2623
Caucasian	-4.5131	-0.6159	0.3444	0.0605	6.0585	0.2623
Alien	-5.6380	-0.7413	8.2456	0.2588	10.5477	0.2632
Under age 19	-0.4718	-0.1146 *	0.7755	0.1203 *	0.0006	0.0001
Over age 19	-0.0457	-0.0107	0.5239	0.0875	-0.6678	-0.1474 *
H.S. diploma	-1.8656	-0.4227 *	0.2350	0.0425	0.4814	0.0824
Low ACT score	0.0541	0.0125	-0.0580	-0.0113	-0.3104	-0.0644 *
High ACT score	-0.8613	-0.2113 **	0.1585	0.0292	0.1024	0.0194
Math remedial placement	1.1475	0.2109 **	-0.7248	-0.1601 **	-0.5775	-0.1257 **
English remedial placement	0.2877	0.0638	0.4120	0.0710	-0.1406	-0.0282
Reading remedial placement	0.2031	0.0359 *	0.1743	0.0320	-0.0284	-0.0055
Heavy course load	-0.8200	-0.2012	0.1505	0.0278	0.2631	0.0478 *
Declared major	0.2382	0.0533 **	-10.7837	-0.7410	0.0799	0.0152
Pseudo r^2	0.1508		0.2657		0.0586	
Sample mean	0.6345		0.7461		0.7364	
Sample size	2137		2051		1881	
Chi^2	379.513		742.042		117.057	
Predicted Correctly						
Persisters	84.81%		99.93%		96.97%	
Non-persisters	41.36%		42.00%		9.49%	
Overall	68.93%		84.93%		73.95%	

*Note: * $p < .05$, ** $p < .01$, *** $p < .001$*

points). Students who had decided on a major were 5.33 percentage points more likely to be enrolled in the fall of 1996.

Analysis: The variables that influenced first-year persistence for the entering classes of 1993 and 1994 at the research-intensive institution were somewhat similar. However, for the class that entered in the fall of 1995, additional variables were significantly associated with persistence. While gender and age under 19 were still negatively associated with persistence, having a declared major was positively associated with re-enrolling the following fall. However, students with high ACT scores and students with high school diplomas were dramatically less likely to persist.

Did this institution make changes that addressed the performance funding criteria? The positive association of remedial placement in math or reading with persistence might, on the surface, suggest gains. However, a cause-effect relationship is not at all clear. Moreover, these gains were more than offset by the large number of high ACT achievers who left. The large negative delta-p values for both high ACT and diploma are puzzling. The institution needs to perform further research to examine why these students, who should be academically talented, departed by the end of the first year.

Low-income students [enterting the HBCU in 1993] were 32.87 percentage points less likely to persist than students who were not Pell eligible.

Historically Black Institution

For the class entering in 1993 at the HBCU, two variables were significantly associated with persistence (see Table 3). Students who were placed in remedial English were 31.95 percentage points less likely to persist than those who were placed in college-level English, and women were 24.2 percentage points more likely to persist than men.

For the class entering in the fall of 1994, two variables were significant and associated with persistence to the fall of 1995. Women were 8.51 percentage points more likely to persist than men. First-time entering students over 19 years of age were 13.73 percentage points less likely to persist than their younger classmates. Ethnicity variables, with the exception of African American and Hispanic, were forced out of the model due to lack of enrollment of "other race" students in 1994.

Five variables were significantly associated with persistence to the fall of 1996 for the class entering in the fall of 1995. Women were 11.23 percentage points less likely than men to persist to the fall of 1996. Younger students (those less than 19 years old) were 9.47 percentage points more likely to persist than older students. Students with a high school diploma were 32.91 percentage points more likely to persist than those with a GED. First-time entering students who took more than 15 semester credit hours (which we labeled a "heavy course load") were 12.65 percentage points more likely to persist than students with a lighter course load. Finally, students who had not declared a major were 10.67 percentage points less likely to persist than students who had declared a major.

The model statistics presented an enigmatic picture for the HBCU. The original model correctly predicted a high percentage of both persisters and non-persisters in 1993, but the variance explained by the model was substantially lower than the results for the other two campuses as evidenced by the pseudo r^2. Based on these results the authors requested additional data as suggested by earlier minority persistence studies from the HBCU. This second model was developed solely for further investigation into the dynamics of persistence. The

TABLE 3
Results from the HBCU Institution

	1995		1994		1993	
Variable	**Beta**	**Delta-p**	**Beta**	**Delta-p**	**Beta**	**Delta-p**
In-state resident	-0.0604	-0.0149	-0.3348	-0.0833	0.4465	0.1096
Gender (female)	-0.4511	-0.1123 **	0.3579	0.0851 *	1.0630	0.2420 *
Asian	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
African American	0.9363	0.2032	0.4300	0.1013	29.9236	0.4949
Hispanic	0.0000	0.0000	-3.4932	-0.5270	0.0000	0.0000
Native American	0.0000	0.0000	0.0000	0.0000	28.6637	0.4949
Caucasian	0.0000	0.0000	0.0000	0.0000	29.0694	0.4949
Alien	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Under age 19	0.4003	0.0947 *	0.1587	0.0385	0.9157	0.2132
Over age 19	0.4424	0.1041	-0.5526	-0.1373 *	-11.2991	-0.5051
H.S. diploma	1.8688	0.3291 *	0.4804	0.1124	29.2916	0.4949
Low ACT score	0.2964	0.0710	-0.4002	-0.0996	-18.9951	-0.5051
High ACT score	0.7849	0.1752	-0.6167	-0.1529	-7.8442	-0.5047
Math remedial placement	-0.1769	-0.0439	-0.1614	-0.0400	0.0625	0.0156
English remedial placement	-0.0946	-0.0234	-0.1984	-0.0492	-1.4995	-0.3195 **
Reading remedial placement	-0.4171	-0.1038	0.1542	0.0374	22.7262	0.4949
Heavy course load	0.5454	0.1265 *	0.3588	0.0853	-53.4949	-0.5051
Declared major	-0.4288	-0.1067 *	-0.1335	-0.0330	9.5653	0.4948
Pseudo r^2	0.0674		0.0654		0.559	
Sample mean	0.5646		0.565		0.5051	
Sample size	565		669		885	
Chi^2	40.811		46.811		1121.907	
Predicted Correctly						
Persisters	81.50%		79.37%		95.97%	
Non-persisters	33.33%		42.96%		98.17%	
Overall	60.53%		63.53%		97.06%	

*Note: * $p < .05$, ** $p < .01$, *** $p < .001$*

variables and the results from this second model are found in Table 4. Variables were coded slightly differently in an attempt to tailor this model specifically to the institution.

Historically Black Institution Expanded Model

Using the additional data on first-time entering first-year students in 1993, six variables were significant at the .01 percent level and three at the .05 percent level (Table 4). Low-income students (receipt of a Federal Pell Grant was used as a proxy for low income) were 32.87 percentage points less likely to persist than students who were not Pell eligible. Academic preparation and performance also were significantly associated with persistence, while students with low ACT scores and low col-

TABLE 4
Results from the Expanded Model

Variable	1995 Beta	1995 Delta-p	1994 Beta	1994 Delta-p	1993 Beta	1993 Delta-p
Accepted	-0.2321	-0.0576	0.0275	0.0069	0.2293	0.0554
Federal Pell	0.0191	0.0047	0.0517	0.0129	-1.4378	-0.3287 **
African American	1.5517	0.2937 *	4.3339	0.4835	1.4124	0.2780
H.S. diploma	1.5243	0.2904	1.8112	0.3575 *	0.2807	0.0674
Ethnicity (other than African American)	0.0000	0.0000	-3.3109	-0.4681	-0.4518	-0.1125
Gender (female)	-0.6611	-0.1636 **	0.1804	0.0449	0.1158	0.0283
High ACT score	-0.3139	-0.0781	-0.1649	-0.0412	-0.0124	-0.0031
High college GPA	1.7829	0.3192 **	0.9131	0.2129 **	0.8569	0.1892 **
High H.S. score	0.1426	0.0346	0.2623	0.0651	-0.4169	-0.1038 *
Low ACT score	-0.1106	-0.0273	0.0280	0.0070	-0.6499	-0.1609 **
Low college GPA	-0.9164	-0.2233 **	-0.6953	-0.1676 *	-0.6123	-0.1518 **
Low H.S. GPA	0.4232	0.0996	-0.2359	-0.0588	-0.0934	-0.0231
Declared major	0.8918	0.1946 **	1.1809	0.2640 **	2.0407	0.3454 **
Married	-0.4522	-0.1125	1.4102	0.3024 *	-0.7823	-0.1922
Over age 19	0.9134	0.1985 *	-0.7565	-0.1811 *	0.8595	0.1897 *
Under age 19	0.5028	0.0179	0.0733	0.0183	0.7487	0.1685 **
In-state resident	0.0015	0.0004	0.3344	0.0827	0.5162	0.1204 *
Pseudo r^2	0.1928		0.2300		0.2533	
Sample mean	0.567		0.503		0.563	
Sample size	582		792		913	
Chi^2	139.00		236.614		396.734	
Predicted Correctly						
Persisters	75.18%		76.69%		82.10%	
Non-persisters	63.49%		66.16%		71.93%	
Overall	70.10%		71.46%		77.66%	

*Note: * $p < .05$, ** $p < .01$, *** $p < .001$*

lege grade point averages were less likely to persist. Persistence was enhanced by 34.54 percentage points for a student who declared a major and 12.04 percentage points if a student was an in-state resident.

In 1993, an interesting picture emerged in respect to the association of age and persistence. Students under age 19 were 16.85 percentage points more likely to persist, and those students over age 19 were 18.97 percentage points more likely to persist. Both groups were compared to 19-year-olds, which indicated that this "traditional" sophomore-age student is more likely to leave.

Analysis: With the exception of gender, there were no variables in common with the original data set that influenced persistence at the HBCU. Placement data exhibited a negative trend

in the beta weights, but only placement in remedial English showed any significant association with persistence.

However, the analysis of the additional data, which provided some control based on income, produced several commonalities across the three-year period. College GPA exhibited the trend that one would expect: high performers progress and low performers do not. All entering first-time students are enrolled in the University College at the institution. Students in remedial classes do not declare a major; those who do declare a major persist at a greater rate than those who do not. The remediation variables could be used as a proxy for previous academic preparation. A significant drop in enrollment in 1995 reduced the non-African American student population.

This institution did not change its policies in relation to admission or placement in remedial classes with the advent of performance funding. A further investigation of the links between having an undeclared major, remediation, and non-persistence is suggested.

Regional Institution

Seven variables were significantly associated with persistence for first-time entering students in 1993 at the regional, comprehensive institution (Table 5). Women and younger students were 13.49 and 11.73 percentage points less likely to persist, respectively, than men and students older than 19 years of age. Students declaring a major were 5.82 percentage points more likely to persist than students not declaring a major. Students in math and reading remediation were 24.61 and 4.98 percentage points more likely to persist, respectively. Students with low ACT scores were 20.87 percentage points less likely to persist. Holders of a high school diploma were 38.77 percentage points less likely to persist than those without the diploma.

For the entering class of 1994, women, students with ACT scores in the top third of the entering class, and students in remedial math classes were more likely to persist. Women were 15.81 percentage points more likely to continue to the succeeding fall. Students with ACT scores in the top third of the class were 23.35 percentage points more likely to persist than those with lower scores, and students in remedial math classes were 13.32 percentage points less likely to continue their studies the following year.

But for the class that entered in 1995, only two variables—students with a high school diploma and students taking remedial math—were significantly associated with persistence. Students with a high school diploma were 24.0 percentage points more likely to persist than those without the diploma. Students taking remedial math were 26.53 percentage points less likely to persist than those students taking college level classes.

TABLE 5
Results from the Regional Comprehensive University

	1995		1994		1993	
Variable	**Beta**	**Delta-p**	**Beta**	**Delta-p**	**Beta**	**Delta-p**
In-state resident	-0.2518	-0.0629	0.6178	0.1473	0.3481	0.0843
Gender (female)	0.3768	0.0918	0.6670	0.1581 **	-0.5441	-0.1349 **
Asian	6.7592	0.4693	3.4350	0.4479	-4.9270	-0.4928
African American	6.2571	0.4686	3.0626	0.4356	-4.6429	-0.5318
Hispanic	7.6693	0.4699	3.9349	0.4589	-4.1257	-0.5318
Native American	7.7770	0.4700	4.0316	0.4605	-3.8233	-0.5178
Caucasian	6.5489	0.4691	3.3516	0.4455	-4.5131	-0.5302
Alien	0.0000	0.0000	0.0000	0.0000	-5.6380	-0.5389
Under age 19	0.1405	0.0349	0.0505	0.0126	-0.4718	-0.1173 *
Over age 19	0.1022	0.0254	-0.5084	-0.1257	-0.0457	-0.0114
H.S. diploma	1.0746	0.2394 *	0.5693	0.1362	-1.8656	-0.3877 **
Low ACT score	0.4430	0.1076	0.3144	0.0771	0.0541	0.0134
High ACT score	-0.1989	-0.0497	1.0465	0.2335 **	-0.8613	-0.2087 **
Math remedial placement	-1.1495	-0.2653 **	-0.5397	-0.1332 *	1.1475	0.2461 **
English remedial placement	-0.3316	-0.0826	-0.4859	-0.1203	0.2877	0.0700
Reading remedial placement	-0.1653	-0.0413	0.0574	0.0143	0.2031	0.0498 *
Heavy course load	0.0000	0.0000	-0.0235	-0.0059	-0.8200	-0.1995
Declared major	-0.1548	-0.0387	0.1797	0.0445	0.2382	0.0582 *
Pseudo r^2	0.0941		0.1060		0.0906	
Sample mean	0.5296		0.5236		0.5431	
Sample size	489		487		510	
Chi^2	50.77		57.75		50.797	
Predicted Correctly						
Persisters	66.80%		69.02%		72.56%	
Non-persisters	58.70%		59.05%		50.64%	
Overall	62.99%		64.27%		62.55%	

*Note: * $p < .05$, ** $p < .01$, *** $p < .001$*

Analysis: There appears to be very little similarity in the variables significantly associated with persistence at the regional institution. Even gender shows differing effects based on the year being analyzed. Placement in remedial math shows a negative trend over two of the three years. The changes in the delta-p values for students with high ACT scores needs more examination.

Discussion

The variables that affected first-to-second year persistence of full-time students at the three institutions varied widely by year and by school. Some general observations can be made, however. First, persistence may be improved, while still negative overall, for those students taking remedial courses. Math

remediation was negatively associated with persistence at two schools for two of the years examined. Often taught by non-tenure-track faculty in non-academic departments, the remedial courses need stronger ties to the core curriculum and academic departments. Just as "writing across the curriculum" has improved students' writing skills, so should remedial math and reading be connected to the rest of the curriculum.

Second, during the three years studied, the association between gender and persistence varied. At all schools, gender was negatively associated with persistence during one year and positively associated with persistence in at least one other year. This variability begs for further examination by each institution of the problems that women encounter.

Third, while ethnicity was generally not associated with persistence, each school needs to examine closely the patterns of minority student enrollment. The relatively small minority enrollment in institutions in this study tended to skew the results. At least one of the institutions had so few minority students that all of the ethnicity variables fell out of the regression. Since minority retention is one of the performance indicators in this state, even small improvements in minority enrollment and retention could yield additional funds.

Fourth, a heavier-than-average academic load may negatively affect persistence. This indicates the need for a system-wide review of academic overload policies for first-year students.

Fifth, students are more likely to persist if they have declared a major. This may indicate that students who have a major are connected to departments and faculty members, which is one of the components of academic integration. The institutions that assign "undecided" or remedial students to an academic advisor who is not a faculty member might improve persistence by also linking the student to a faculty member.

Sixth, few new initiatives to retain students were begun as a result of the addition of performance indicators to the funding formula. Absent are sophisticated financial aid packaging strategies, first-year experience courses (e.g., special seminars only for first-year students), a more inclusive orientation program, the development of learning communities, and new strategies for remediation, all of which might improve first-to-second year persistence. The leadership at each of the institutions needs to be more aggressive in addressing persistence issues and involving faculty in this effort.

Public Policy Implications

What does this study tell us about using first-to-second year persistence as a performance indicator? There are several issues that can be explored. First, the model used was good at predicting who would persist, but not as good at predicting non-

persisters. Controversy surrounded the adoption of performance indicators in this state. After the legislation was passed, the state board adopted the indicators amidst a great deal of political maneuvering. The system was not based on theory; it was more of a political compromise than a means of identifying the needs or priorities for higher education. Thus, the compromise indicators tended to be readily available statistics that measured past performance rather than potential future improvements. Further, no follow-up has been done to determine the results, any unintended consequences, and the durability of the performance indicators.

Second, the plan was developed to financially reward those schools that meet the performance criteria. Schools were left to their own devices to develop and implement programs to meet these objectives. Lacking were the means of funding special initiatives to support schools in difficulty. This perpetuated a cycle where institutions with established lower persistence rates had fewer resources to improve persistence, compounding the original problem. Schools that needed most to change were the least able to fund any changes.

Rather than making comparisons across institutional type or internal comparisons from year to year, schools' retention rates should be compared to retention standards based on type of institution.

This reverse Robin Hood philosophy only exacerbates the widening gap between the "haves" and "have-nots" in higher education. Private universities are exempt from productivity requirements and are free to allocate their resources as they choose. Within the public sector, there is a trend toward privatizing research institutions. With their large base of federal grants, corporate support, and graduate education, these schools are much less affected by state funding formulas that reward undergraduate performance criteria.

Third, this study reiterates Astin's (1993) assertion that outcome measures are determined in large part by the input. Two of the three schools in the study had a homogeneous group of students who were underprepared for college. Rather than making comparisons across institutional type (as the performance funding "report cards" tend to do) or internal comparisons from year to year, schools' retention rates should be compared to retention standards based on type of institution. Just as Astin (1993) calculated expected and actual graduation rates for various types of institutions, the performance indicators should be developed by institutional type (Carnegie classification, role and mission, etc.). Further, an outcomes-based measure ignores process. Systems that do not consider process measures are unable to account for variables that might account for variations or assist institutions in developing strategies for improvement (Nedwek, 1996).

However, the results of this study included limited data on student aid, net cost, and other financial variables. Previous studies (Andrieu & St. John, 1993; Somers, 1994, 1995, 1996; St. John, 1992; 1994, 1995a, 1995b) indicate that persistence decisions can be influenced by cost. Thus, in this low

tuition/low aid state, the performance monies might have been equally or more effective in promoting persistence if they had been used to reduce tuition or for student grants.

The results from this study could be used in Machiavellian ways to manipulate the performance funding system. For example, "buying" students through institutional grants and scholarships would probably increase the persistence rate, yielding more state dollars. This would be a short-term approach that in the long term could lead to dissatisfied students leaving the institution. Likewise, persistence could be promoted and remediation decreased by a strategy of grade inflation.

Performance indicators are the latest in a long line of "quick fixes" that are attractive to policymakers because of the lure of immediate results. However, low persistence rates are not amenable to the quick fix. Persistence is a long-term problem for institutions and students. For institutions, promoting student persistence is an ongoing, dynamic process. For students, the problem may be being born into a family that is not educationally rich, being shortchanged by the elementary and secondary school education system, or being disadvantaged in other ways. For these students, performance funding is a tragi-comic remedy that comes twenty years too late.

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